

# *Hemicycliophora dhirendri* Husain & Khan, 1967, a junior synonym of *H. labiata* Colbran, 1960 (Nematoda : Criconematidae)

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**Summary** – Populations of *Hemicycliophora dhirendri* Husain & Khan, 1967 from Aligarh, the type locality, and Saharanpur, U.P. (India) were studied in detail. Comparisons with *H. labiata* Colbran, 1960 indicated that the two species are almost indistinguishable from one another. Therefore *H. dhirendri* is proposed as a junior synonym of *H. labiata*.

**Résumé** – *Hemicycliophora dhirendri* Husain & Khan, 1967, un synonyme mineur de *H. labiata* Colbran 1960 (Nematoda : Criconematidae) – Des populations d'*Hemicycliophora dhirendri* Husain & Khan, 1967 provenant d'Aligarh, la localité type, et de Saharanpur, U.P. (Inde) ont été étudiées de façon détaillée. Les comparaisons faites avec *H. labiata* Colbran, 1960 indiquent que ces deux espèces sont presque indistinguables l'une de l'autre. En conséquence, *H. dhirendri* doit être considéré comme un synonyme mineur de *H. labiata*.

**Key-words** : *Hemicycliophora*, nematode, synonymy, taxonomy.

*Hemicycliophora dhirendri* was described by Husain and Khan (1967). Brzeski (1974) considered this species as *species inquirenda*, as he felt that its description does not permit its identification. Later, Siddiqi (1980; 1986) and Raski and Luc (1987) recognized it as valid. We collected *H. dhirendri* from two localities, one being the type locality, and present here complements to the description of the species and a discussion about its status.

The specimens for light microscopy were killed and fixed in hot 4 % formalin, dehydrated and mounted in anhydrous glycerine. Measurements were made with an ocular micrometer. Dimensions were taken along the inner cuticle. For SEM, formalin fixed specimens were washed in buffer, post-fixed in osmium tetroxide, dehydrated in an alcohol series and critical point dried in CO<sub>2</sub>. After coating with 30 nm gold, the specimens were observed in a Hitachi S-2300 scanning electron microscope at 15 kV.

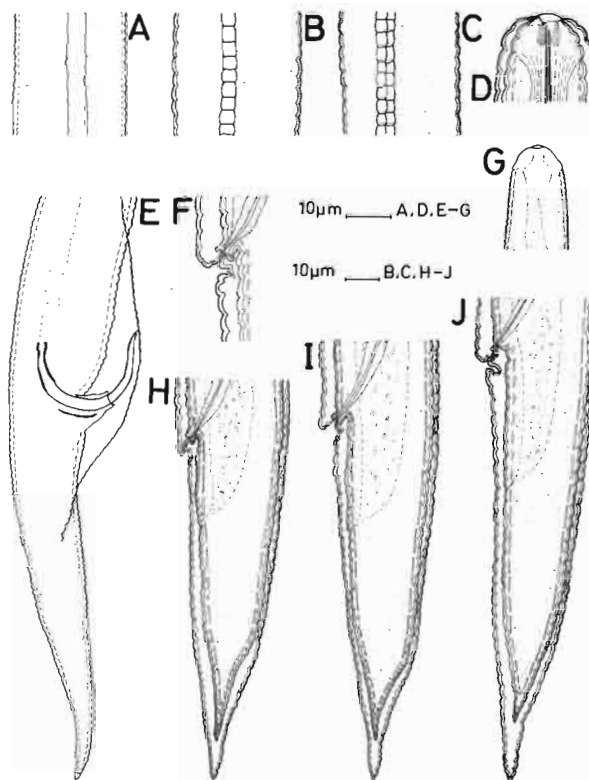
## *Hemicycliophora dhirendri* Husain & Khan, 1967 (Figs 1, 2)

### DIMENSIONS

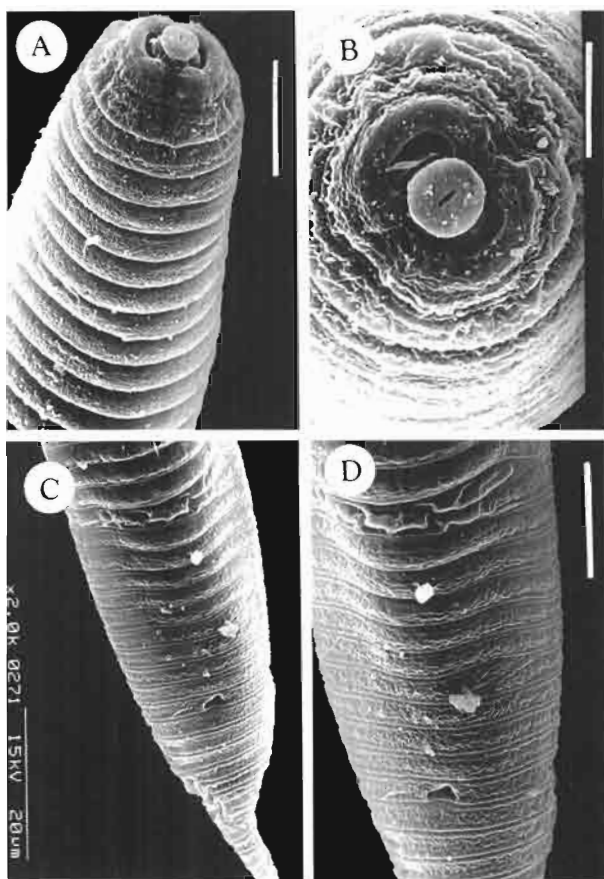
See Table 1

### OBSERVATIONS

**Females** : Lip region slightly set-off with three annules. In en face view lip region oval, dorso-ventrally indented. Oral disc distinctly raised, circular, differentiated into a central part and a broad collar. Central part of oral disc with a dorso-ventral slit-like oral aperture. Amphidial apertures wide, kidney-shaped, partially covered by plug-like structures, surrounded by first head annule.



**Fig. 1.** *Hemicycliophora dhirendri* Husain & Khan, 1967 (= *H. labiata* Colbran, 1960). A : Male lateral field at midbody; B, C : Female lateral field at midbody; D : Female head region; E : Male posterior region; F : Vulval region; G : Male head region; H-J : Post-vulval region.



**Fig. 2.** *Hemicycliophora dhirendri* Husain & Khan, 1967 (= *H. labiata* Colbran, 1960). A: Female anterior end; B: En face view; C: Posterior end; D: Vulva-anal region. (Bar equivalents: A, D = 10  $\mu$ m; B, C = 20  $\mu$ m.)

First head annule depressed laterally. Lateral field with two or three lines forming a single or two rows of squarish blocks. Vulva a transverse slit, vulval lips elongated, one or two annules long, anterior vulval lip irregular in shape. Post-vulval region convex conoid then spicate.

**Males:** Lip region smooth. Lateral field with two lines, irregularly crenated at midbody. Spicules U-shaped. Gubernaculum simple, slightly arcuate. Penial tube distinct. Bursa adanal, crenated. Tail long conoid.

#### HABITAT AND LOCALITIES

Soil from the rhizosphere of *i*) motha grass (*Cyperus rotundus* L.) from campus, Aligarh Muslim University, Aligarh, *ii*) unidentified grasses from Saharanpur, Uttar Pradesh, India.

#### REMARKS

*Hemicycliophora dhirendri* was described from the campus of the Aligarh Muslim University, Aligarh, India. In the present study, two populations of *H. dhirendri* were collected, one from the type locality and another

**Table 1.** Measurements (in  $\mu$ m) of *Hemicycliophora dhirendri*.

	Aligarh Population	Saharanpur Population	Orig. descript.
<b>FEMALES</b>			
n.	25	20	6
L	740-820 (770 $\pm$ 30)	600-800 (680 $\pm$ 40)	640-770
a	21.9-25.3 (23.7 $\pm$ 1.1)	18-26 (22.6 $\pm$ 2.9)	15-24
b	5.7-6.0 (5.9 $\pm$ 0.1)	4.6-6.3 (5.5 $\pm$ 0.85)	5.2-6.3
c	9.2-12.9 (10.9 $\pm$ 1.0)	8.5-10.4 (9.5 $\pm$ 0.7)	11-12
c'	2.7-3.1 (2.9 $\pm$ 0.2)	3-4 (3.6 $\pm$ 0.3)	—
V	85.2-87.7 (86.2 $\pm$ 0.9)	83-85 (84.3 $\pm$ 1.1)	80-85
Stylet	59-66 (64.0 $\pm$ 2.5)	55-64 (59.0 $\pm$ 1.7)	67-70
Conus	46-53 (50.8 $\pm$ 3)	44-48 (46.5 $\pm$ 1.1)	45-48
tail	64-82 (71.4 $\pm$ 6)	70-82 (76.2 $\pm$ 3.6)	—
R	195-215 (208)	180-210 (192)	100-240
Rst	16-18 (17)	16-18 (17)	18-20
Roes	33-38 (35)	30-36 (34)	36*
Rex	39-41 (40)	35-42 (38)	38-42
Rv	157-170 (164)	155-178 (162)	—
Rvan	10-15 (12)	10-15 (13)	—
Ran	28-36 (32)	18-28 (25)	—
VL/VB	3.0-4.3 (3.6 $\pm$ 0.4)	3.8-4.2 (3.9 $\pm$ 0.1)	—
St % L	7.9-8.6 (8.2 $\pm$ 0.3)	8.1-8.6 (8.4 $\pm$ 0.2)	—
<b>MALES</b>			
n	4	4	2
L	560-600 (580 $\pm$ 20)	520-590 (560 $\pm$ 30)	560-640
a	26.9-29.8 (28.4 $\pm$ 1.5)	23-26 (24.5 $\pm$ 2.4)	20-27
c	7.0-7.9 (7.5 $\pm$ 0.4)	7.0-9.2 (8.0 $\pm$ 0.82)	7.0-7.2
c'	3-4 (3.5 $\pm$ 0.5)	4.0-5.2 (4.8 $\pm$ 0.4)	4.5*
Spicules	36-40 (38.5 $\pm$ 1.4)	36-42 (39.0 $\pm$ 2.3)	40-41
Gubernaculum	9	9	10
Bursa	45-56 (49.5 $\pm$ 4.5)	36-42 (39.5 $\pm$ 2.2)	—
Tail	76-82 (78.0 $\pm$ 2.8)	80-88 (82 $\pm$ 5)	—

\* Calculated from figure.

**Table 2.** Measurements (in  $\mu\text{m}$ ) of *Hemicycliophora labiata* populations

	Colbran (1960)	Loof & Heyns (1969)		Brzeski (1974)		Van den Berg (1981)	Van den Berg (1990)	
		South Africa	Australia	Australia	Sri-Lanka	South Africa	Margate pop.	Langebaan pop.
FEMALES								
L	700-860	630-950	760-800	700-850 (780)	770-820 (790)	549-958 (711)	699-798 (751 ± 41)	891-1029 (930 ± 44.7)
a	19-24	18-29	22-25	18-31 (22)	25-26	15.6-25.9 (21.4)	15.7-20.0 (17.1 ± 1.8)	20.9-26.9 (23.4 ± 1.8)
b	5.2-6.1	5.0-6.6	5.7-5.9	5.1-6.0 (5.5)	5.8-6.1 (6.0)	4.7-6.4 (5.5)	5.4-5.7 (5.5 ± 0.1)	5.8-6.6 (6.1 ± 0.3)
c	—	7.0-11.6	11.6-11.7	7.9-12.2 (9.7)	9.5-10.4 (10)	6.7-11.4 (8.5)	8.3-10.2 (9.5 ± 0.9)	11.5-14.7 (12.9 ± 1.1)
V	81-86	81-87	84-86	82-87 (84)	84-85	80-87 (83)	82-85 (84 ± 1)	85-91 (88 ± 1.6)
Stylet	66-75	53-79	67	66-73 (69)	62-67 (65)	56.6-76.9 (66.8)	62.1-70.2 (65.5 ± 3.2)	68.8-76.8 (72.8 ± 2.8)
R	200	186-250	201-204	185-236 (207)	181-217 (201)	178-227	175-192	225-263
Rst	—	—	—	—	—	17-24	15-18	16-24
Roes	—	—	—	—	—	32-41	30-37	34-45
Rex	—	35-47	36-38	39-47 (44)	42-44 (42)	35-47	35-40	38-47
Rv	—	34-59	45	—	—	33-52	33-47	34-58
Rvan	—	9-20	15-17	10-14 (12)	12-15 (13)	10-15	9-14	9-17
Ran	—	23-44	27-29	21-33 (28)	23-32 (27)	23-28	24-33	22-42
VL/VB	—	—	—	3.1-4.7 (3.7)	4.1-5.0 (4.5)	2.4-5.3 (3.9)	2.8-3.3 (3.1 ± 0.2)	2.4-3.3 (2.8 ± 0.3)
St % L	—	—	—	—	—	8.0-11.1 (9.5)	8.4-8.9 (8.7 ± 0.2)	7.3-8.2 (7.9 ± 0.3)
MALES								
L	—	710	—	—	—	—	549-643 (595 ± 32)	761-841 (801 ± 28.7)
a	—	37	—	—	—	—	23.7-30.0 (28 ± 1.9)	29.3-34.7 (33 ± 2.2)
b	—	6.2	—	—	—	—	5.4-5.7 (5.6 ± 0.2)	5-6 (5.4 ± 0.5)
c	—	7.6	—	—	—	—	5.8-7.0 (6.3 ± 0.4)	6.2-7.4 (6.5 ± 0.5)
c'	—	—	—	—	—	—	5.3-7.8 (6 ± 0.8)	5.2-6.7 (6.2 ± 0.6)
Tail	—	—	—	—	—	—	79-109 (95 ± 9.4)	107-136 (125 ± 10.8)
Spicules	—	50	—	—	—	—	41.9-47.4 (43.4 ± 2.1)	59.5-50.0 (49.7 ± 0.4)
Gubernaculum	—	—	—	—	—	—	5.1-8.1 (6.9 ± 0.9)	8-10 (8.8 ± 0.8)

from Saharanpur (U.P.). These two populations are almost identical in both measurements and morphology and conform well with the original description of *H. dhirendri* (Table 1); they differ only in having a relatively smaller stylet (55-66 *vs* 67-70 µm), in the number of body annules (R = 170-215 *vs* 100-240), in the number of lip annules (three *vs* one or two annules in description, but illustration with three lip annules), and in the number of lateral lines (two to three *vs* one). The R value given in the original description seems somewhat unusual in that the upper value of the range is nearly two and half times the lower one. The description of the lateral lines is somewhat vague "lateral field a single line crossed by transverse annulations and forming rectangular blocks". SEM and LM examination of our specimens leaves no doubt about the number of lip annules.

*H. dhirendri* closely resembles *H. labiata* Colbran, 1960 in body shape, structure of lip region, vulval region, and body measurements. The descriptions and measurements of *H. labiata* given in the original description as well as the measurements subsequently provided by Loof & Heyns (1969), Brzeski (1974), and Van den Berg (1981, 1990) – except Langebaan population from South Africa (Van den Berg, 1990) – (Table 2) overlap with those of the two populations of *H. dhirendri* under study as well as the original measurements (Husain & Khan, 1967). The Langebaan populations of *H. labiata* differ in having a longer body and proportionately greater morphometric and allometric values. The scanning electron micrographs of the labial region of our specimens show a structure that is almost identical to that observed in *H. labiata* by Loof (1985) but with slightly narrower amphidial apertures and narrower first lip annule. The males of the two species also appear to be identical.

The original description of *H. dhirendri* was based on six females and two males. The paratypes were said to be in the personal collection of the late Prof. S. I. Husain, and the holotype and allotype specimens in the Plant Pathology collection of the Department of Botany, A.M.U., which was also curated by Prof. Husain. None of these specimens could be found in the Botany Department and therefore we were not able to study them.

Nevertheless, from the study of specimens collected by us from the type locality, we are reasonably convinced that *H. dhirendri* and *H. labiata* are conspecific. Consequently, *H. dhirendri* is here proposed as a junior synonym of *H. labiata*.

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